

CLAIMS

I claim:

1. A method of processing a request for resources within a compute environment, the method comprising:
 - receiving a request for resources;
 - generating a credential map for each credential associated with the request, the credential map comprising a first type of resource mapping and a second type of resource mapping;
 - generating a resource availability map;
 - generating a first composite intersecting map that intersects the resource availability map with a first type of resource mapping of all the generated credential maps;
 - generating a second composite intersecting map that intersects the resource availability map and a second type of resource mapping of all the generated credential maps; and
 - allocating resources within the compute environment for the request based on at least one of the first composite intersecting map and the second composite intersecting map.
2. The method of claim 1, wherein the first type of resource mapping is a reserved resource mapping and the second type of resource mapping is a consumed resource mapping.
3. The method of claim 1, wherein the request is a request for one of a job or a reservation.
4. The method of claim 1, wherein the request further comprises at least one credential.
5. The method of claim 4, wherein the at least one credential comprises at least one of: a user, a group, a number of processors, a number of jobs, a quality of service, a number of nodes, a bandwidth, licensing availability, a time frame and a cost.
6. The method of claim 1, wherein each credential map is time-based.
7. The method of claim 1, wherein after generating the first composite map and the second composite map, the method comprises:
 - optimizing a time frame for reserving resources for the request based on one of the first composite map or the second composite map.
8. The method of claim 7, wherein the optimized time frame is one of: the earliest time frame that the allocation of resources may be made and the time frame which will make the most efficient use of the compute resources.

9. The method of claim 7, wherein the first composite map relates to consumed resources and wherein the step of optimizing a time frame for allocating resources is based on the first composite map.
10. The method of claim 9, further comprising:
determining whether, based on the second composite map that relates to reserved resources, the optimized time frame for reserving resources does not overlap with any consumed resources and is completely within the reserved resources, and if so, then the step of allocating resources is performed without any credential constraints.
11. The method of claim 10, wherein, if the optimized time frame does not overlap consumed resources but requires unreserved resources, the step of allocating resources further comprises reserving new resources according to credential constraints.
12. The method of claim 11, wherein reserving new resources according to credential constraints further comprises identifying an amount of unreserved resources that are available for reservation according to credential constraints.
13. The method of claim 12, wherein identifying an amount of unreserved resources that are available for reservation according to credential constraints further comprises determining a difference between unreserved resources and previously reserved resources that will satisfy the request for resources.
14. The method of claim 13, wherein the difference between unreserved resources and previously reserved resources further is based on consumed resources.
15. A system for processing a request for resources within a compute environment, the method comprising:
a module configured to receive a request for resources;
a module configured to generate a credential map for each credential associated with the request, the credential map comprising a first type of resource mapping and a second type of resource mapping;
a module configured to generate a resource availability map;
a module configured to generate a first composite intersecting map that intersects the resource availability map with a first type of resource mapping of all the generated credential maps;
a module configured to generate a second composite intersecting map that intersects the

resource availability map and a second type of resource mapping of all the generated credential maps; and

a module configured to allocate resources within the compute environment for the request based on at least one of the first composite intersecting map and the second composite intersecting map.

16. A computer-readable medium storing instructions for controlling a computing device to process a request for resources within a compute environment, the instructions comprising:

receiving a request for resources;

generating a credential map for each credential associated with the request, the credential map comprising a first type of resource mapping and a second type of resource mapping;

generating a resource availability map;

generating a first composite intersecting map that intersects the resource availability map with a first type of resource mapping of all the generated credential maps;

generating a second composite intersecting map that intersects the resource availability map and a second type of resource mapping of all the generated credential maps; and

allocating resources within the compute environment for the request based on at least one of the first composite intersecting map and the second composite intersecting map.